RESPONSES TO U. S. DEPARTMENT OF ENERGY COMMENTS

DRAFT FINAL PHASE I RFI/RI WORK PLAN FOR OPERABLE UNIT NO. 9 (ORIGINAL PROCESS WASTE LINES) ROCKY FLATS PLANT

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS PLANT
GOLDEN, COLORADO

ENVIRONMENTAL RESTORATION PROGRAM

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RESPONSES TO HAZWRAP COMMENTS
DRAFT FINAL PHASE I ENVIRONMENTAL EVALUATION WORK PLAN
FOR OPERABLE UNIT NO. 9

CRITICAL COMMENTS

1. Data Quality Objectives (DQOs) have not been met and need to be given serious consideration in this work plan.

Response: The sections on DQOs have been extensively revised in the Work Plan, and DQOs will be further revised after Tasks 1 and 2 are implemented.

GENERAL COMMENTS

1. The Environmental Evaluation (EE) Work Plan (WP) does not completely fulfill the recommended Environmental Protection Agency (EPA) guidance for preparation of an RI/FS Work Plan and a Field Sampling Plan (FSP). The most significant shortcomings in the EEWP as compared to the EPA guidance are deficiencies in: (1) project scoping, which should include the initial evaluation of existing data and information on the context of conceptual model development; and (2) the work plan rationale, which should include the definition of the environmental risk assessment methodology and associated data needs.

Response: The project scoping and work plan rationale sections were revised to the degree possible.

2. The most obvious deficiency in the work plan, and one that plagues every Department of Energy (DOE) Operable Unit (OU) EE, is an adequate project scoping. Tasks 1 and 2 essentially comprise project scoping, as defined in EPA guidance. This scoping is supposed to culminate in development of a sound work plan and RFI/RI effort. It is supposed to be completed as part of work plan development. Since project scoping has not been adequate, work plan development cannot be adequate. The work plan that should be reviewed by the regulators is one produced at the end of Tasks 1 & 2, with the addition of a reconnaissance/pilot study as part of Task 2.

Response: Those portions of Tasks 1 and 2 that were completed have been identified.

3. The EEWP lacks an adequate discussion of the impact and risk assessment methodologies. In general, DOE has failed to demonstrate how risks and impacts will be assessed (based mainly on tissue burdens, and how exposure to suites of contaminants will be addressed. The methodology used to define remediation criteria in the pathways analyses should be explained in detail. The general nature of the discussion precludes an adequate evaluation of the criteria development methodology, the uncertainties associated with the methodology, and how these criteria can be used in impact assessment.

Response: The methodology in the work plan for impact and risk assessment is adequate for a Phase I study. This methodology will be further developed as the
Work Plan is implemented.

4. In general, the EEWP is not clear regarding the qualitative/quantitative aspects of the effort. Environmental risk and impacts define one of two threshold criteria for evaluating remedial alternatives under the National Contingency Plan (NCP). The EE must provide the information for a meaningful evaluation, and the study should be as quantitative as is reasonable. The level of quantification should be clearly defined and supported in the EE. Those aspects of the EE that will be addressed qualitatively should be defined, and the limitations of a qualitative assessment discussed.

Response: We agree that the qualitative/quantitative aspect are not adequate, and this part of the risk assessment is being further developed.

5. The DQO process should be discussed in detail. The work plan should provide a solid generic methodologies for DQO development. We suggest the DQO process be revisited, and a firm generic methodology be developed along the lines of Neptune et al. at EPA Quality Assurance Management Staff. DOE needs to provide a framework wherein DWOs can be reviewed and approved by regulators.

Response: The DQO process in the work plan was enlarged and revised to include the generic methodology. See response to Comment 1.

6. The EE correctly recognizes the limitations of using biological parameters in impact assessment in disturbed habitats (due to their high variability). We suggest that use of any of the standard impact assessment methodologies using such parameters be de-emphasized, and the implementation of any of these methodologies be quantitatively based. Data for making such determinations could be generated during a Task II reconnaissance/pilot study.

Response: The Work Plan does de-emphasize the use of standard biological parameters, and the plan provides for development of appropriate methodology in disturbed habitats.

7. In a similar context, we are concerned that the precise use to which reference areas will be put has not been fully defined (i.e., in a quantitative context). Reference area comparisons will be very difficult in the disturbed habitats of OU9. The EEWP should describe in detail the approach to impact or risk assessment to be employed using these reference areas. Even more important, DOE should justify on quantitative grounds, the feasibility of using this approach by acquiring key quantitative data during a reconnaissance/pilot study.

Response: The Plan recognizes the difficulty of using reference area comparisons in disturbed habitats.

8. The EEWP indicates that the ecological inventory stations will be located at, or in the immediate vicinity of, stations at which abiotic media will be characterized for contaminant burdens. We are concerned that sufficient data on the nature and extent of contamination will not be available to aid in the selection of the final locations for the ecological inventory sampling, assuming such sampling is necessary. The EEWP indicates that development of criteria for selection of contaminants of concern will occur during Task 1. However, it is not clear that these criteria will influence the selection of contaminants for Phase I sampling of abiotic media.

Response: Comment noted; the selection of contaminants for abiotic media sampling may not be influenced by the ecological inventory sampling.

9. According to the Interagency Agreement (IAG), biota sampling is not required until Phase II RFI/RI. As such, there is justification for delaying Task 3 field efforts until Phase I abiotic data are available for planning. These abiotic data are critical to designing the sampling program.

Response: The Task 3 field efforts will only be started when sufficient information on habitats and biota present has been collected to plan these efforts in detail and based on definitive DQOs.

10. The IAG calls for a baseline risk assessment at the end of Phase I. Since only soils media are extensively characterized during Phase II complete risk assessments are not possible at the end of Phase I. Only those exposure pathways associated with soils contamination can be covered in the risk assessment. It is a partial risk assessment. On this basis, the absence of an EE from the Phase I risk assessment is acceptable, if not

expected (given that biota are to be studied in Phase II).

Response: Although biotic sampling is called for in the Phase II, planning occurs during Phase I. The decision to proceed with an EE and the implementation of the biotic sampling occurs during the the Phase I portion.

11. The overall and generic DOE Rocky Flats Plant (RFP) (ten task) framework for the EE appears sound, but the inclusion of all ten tasks seems very much like overkill for this particular OU. There is a need for decision points to determine if further activities are really needed. This can be provided by the screening level (preliminary) risk assessment model. A decision point for proceeding with the Environmental Evaluation (EE) at OU9 should be defined no later than the completion of Task 2 activities. The EE process is not meant to be applied to industrial or urban environments that harbor little or no natural habitat and associated wildlife. the U.S. Environmental Protection Agency (EPA) states in the *Risk Assessment Guidance for Superfund*, Volume II, Environmental Evaluation Manual (chapter 1) that "...Environmental evaluation at Superfund sites should provide decision-makers with information on threats to the natural environment associated with contaminants or with actions designed to remediate the site..." this guidance manual goes on to say..."Not all sites will require environmental evaluations. Indeed, many are in industrial areas with little or no wildlife..."

    Task 1 and 2 activities should include screening-level assessments of the potential for significant impacts and risks to key receptors from exposure to surface and near-surface soil contamination. Tasks 1 and 2 should include the following activities, which are developed in the context of the conceptual model and on the basis of existing data and data derived from a reconnaissance/pilot study:

    a. Estimates of the aerial extent of natural habitat and the population levels of key receptors that the natural habitat could support (carrying capacity);

    b. Estimates of the aerial extent of surface and near-surface soil contamination in natural habitats;

    c. Estimates of the variability of key biotic parameters to assess the feasibility of these parameters for quantitative impact assessment and hypothesis testing.

    d. Assessment of the potential for populations of key receptors to be adversely affected from exposure to surface and near-surface soil contamination in the context of the expected narrow, linear pattern of contamination (limited banks of contamination along pipeline trenches) and the size of the ranges and activity patterns of populations of key receptors;

    e. Assessment of the ability to link contaminant tissue burdens with the sources addressed in OU9; and

    f. Assessment of the potential for transport of contaminants from OU9 to natural areas in other OUs where key receptors could be significantly exposed.

    g. The ecological assessment endpoints and measurement endpoints should be clearly defined on the basis of PARCC parameters. The endpoints should include the level of reduction in key receptor populations that is judged to represent a significant effect.

Response: The activities planned during Tasks 1 and 2 included the items delineated above. These detailed activities are an iterative process that will be continued to be addressed throughout the EE implementation. Other resultant tasks (Tasks 3 through 10) may or may not be implemented based on decision processes using information developed during Task 1 and 2, including the decision to proceed with an EE.

12. The EEWP identifies the need for coordination and integration of data collection activities with the EEWPs being conducted for OUs 1, 4, 5, and 6. However, the management plan and protocols for realizing this coordination are not discussed. The integration and coordination of the data collection activities (and subsequent interpretations of impacts and risks to receptors) among OUs assumes a similar technical approach in each OU. The reviewers recommend that DOE (1) define how the integration and coordination among OUs will be achieved, and (2) ensure consistency in technical approach in all of the EEs at RFP.

Response: This integration and coordination will be achieved through meetings and exchange of data and information as is developed during the implementation of the EE. The actual mechanisms for integration (meetings, data exchange) need to be developed.

SPECIFIC COMMENTS

1. Section 9.1, p. 9-1, para. 1: The objectives of the baseline EE should include the evaluation of potential ecological effects under future conditions.

   We suggest changing the "ecosystem level of biological organization" to "community level of biological organization." A trophic-based model is very much community-based. At least include a concise description of the "ecosystem approach to ecological risk assessment."

   In the context of OU9, assessment of "populations, structure, productivity, or diversity" is probably not feasible because the site is disturbed and the acreage is small.

   In the last sentence, delete "individual levels" of biological organization and replace "ecosystem" with "community."

Response: Comments noted and text has been modified.

2. Section 9.1, pg. 9-1, para. 3: With regard to the last sentence, we suggest being more specific on the information "from the EEs" that will assist in determining the type,..."and include a summary explanation of how this will be accomplished."

   We suggest that DOE include a summary of NCP requirements for ecological evaluation (i.e., its importance as one of two threshold criteria).

Response: Use of information generated by the EE is a broad category that needs to be addressed by DOE.

3. Section 9.1, pg. 9-1, para. 4: The OU associated with the "previous draft Phase I RFI/RI Work Plan" should be identified.

Response: Text has been modified.

4. Section 9.1, pg. 9-2, para. 1: The role of future use scenarios in these EE assessment activities should be described.

Response: Text has been modified.

5. Section 9.1, p. 9-2, para. 2: The EE objectives should be reviewed and revised. Phrases such as "biological and ecological characteristics" and "biological sensitive environment" need to be clarified.

Response: Text has been modified.

6. Section 9.1.1, p. 9-2, para. 3: Please describe in detail the "weighted best evidence" approach, and how this approach compares to existing approaches commonly used in ecological impact and risk assessments.

The statement regarding uncertainties needs to be supported. A methodology does not appear to have yet been devised.

Response: Text has been modified to identify approach; uncertainties will be quantified as appropriate or necessary.

7. Section 9.1.1, pg. 9-3, para. 1: discuss the role of the Phase I abiotic sampling in meeting these data needs.

Response: The abiotic sampling is planned for Phase I and II to meet these data needs.

8. Section 9.1.1, p. 9-3, para. 3: The management plan and protocols for achieving the integration and coordination of the OU 9 EE with the RFI/RI activities at OUs 1, 4, 5, and 6 should be discussed.

The third sentence beginning with "Contamination that occurs..." should be reworded.

The role of the conceptual model as the framework for the intra-and inter-OU integration activities mentioned herein should be discussed. The discussion of "Migration of contaminated surface or ground waters..." should be expanded and should be model-based.

Response: These comments address activities that will occur during the implementation of the EE.

9. Section 9.1.1, pg. 9-3, para. 4: This information on inter-OU dynamics as pathways in the conceptual risk model should be discussed.

Response: Comment noted, no response. Conceptual models for pathways connecting OUs have not been developed.

10. Section 9.1.1, p. 9-4, para. 2: The Task 1 efforts should have already been accomplished as part of the RI scoping.

Task 1 includes initiation of the DQO development process, but does not mention the preliminary identification of data needs. The preliminary identification of data needs should precede the development of DQOs.

The reference to conceptual models in the last sentence is confusing. The purpose and content of each conceptual model to be developed should be discussed.

Response: The Task 1 efforts that have been accomplished have been identified in the text.

11. Section 9.1.1, p. 9-4, paras, 2 and 3: A decision point for proceeding with the Environmental Evaluation (EE) at OU 9 should be defined no later than the completion of Task 2 activities.

Response: The text has been edited to reflect this decision point.

12. Section 9.1.1, pg. 9-4, paras. 3 & 4 (Tasks 1 & 2): The Task 1 and 2 activities discussed in these paragraphs should be combined under a single task.

Stress the importance of the conceptual model as a framework for Task 2 activities (i.e., the organization of the information collection and synthesis activities, and the identification of key data gaps needed for quantitative impact assessment.

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The inclusion of a Preliminary Risk Assessment in these scoping activities is to be applauded. However, we feel the scope and objectives of this assessment do not meet program needs (as discussed in the general comments above).

"Completing and verifying the list of contaminants of concern (CQCs)..."cannot be accomplished until after the Phase I abiotic sampling results are available. The scheduling implications should be discussed.

A decision point needs to be added to the end of Task 2 that will essentially determine if the assessment of terrestrial ecosystems needs to continue. This decision will be based on the results of the preliminary (screening-level) risk assessment.

Response: The comments have been noted and incorporated into the text to the extent possible.

13. Section 9.1.1, pp. 9-4 & 9.5, para. 5 (Task 3): Move the preliminary field survey (i.e., reconnaissance survey) to the Task 2 scoping activities, and consider expanding, as needed, to address the needs of a screening level risk assessment for the terrestrial ecosystem.

Describe the uses of the quantitative data on community composition collected in the field inventories.

Indicate that these data will be used to refine the conceptual model.

Response: Comment noted and text modified as appropriate.

14. Section 9.1.1, p. 9-5, para. 1: The heading identifying Tasks 4-7 as "Contamination Impact Assessment" is confusing. Do the authors mean "Environmental or Ecological Impact Assessment?" These tasks constitute part of a risk assessment approach. Do the authors view risk assessment and impact assessment as the same process?

The discussion of Task 4 is confusing. The second and third sentences are unclear.

Task 4 assumes that the COCs have been determined, and this, in turn, is dependent on the scheduling of Phase I abiotic sampling. This sequencing does not appear to be feasible.

The reference to "compared to exposures relative to RLDs" is not clear. It sounds like the quotient method.

We suggest deleting the statement that "biomarkers or ecosystem dysfunctions will be determined."

Response: Comment noted and text modified as appropriate.

15. Section 9.1.1, p. 9-5, para. 2: The pathways model approach and the verification methodology should be described in detail.

How "exposure and level of dose" can be determined through literature values should be discussed.

Response: Comments noted, pathways model approach and literature search is still to be developed in detail.

16. Section 9.1.1, p. 9-6, para. 1: Task 6 should be entitled "Preliminary Environmental (or Ecological) Risk

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Characterization."

We suggest deleting the second sentence, which commits DOE to address the "actual or potential effects of contamination on ecological endpoints." This is probably not feasible, and should be so caveated.

Those aspects of the EE that will be addressed qualitatively should be defined, and the limitations of a qualitative assessment discussed.

Please define the "weighted best evidence" approach.

Define "remediation criteria." The discussion of the derivation of remediation criteria is confusing. Please discuss the role of the pathways model in deriving remediation criteria. Please define the "RCRA risk-based criteria."

The circumstances that Task 6 "may" include preliminary derivation of remediation criteria should be described.

Response: Comments noted and text modified as appropriate.

17. Section 9.1.1, p. 9-6, para. 2: Please discuss the methodology for the calibration and validation of the pathways models, and compare these activities to the model verification discussed under Task 5.

Response: Pathways models will be developed in detail during the implementation of the EE.

18. Section 9.1.1, pg. 9-6, para. 3: We suggest modifying the second sentence dealing with "additional population endpoints" to include evaluation of the feasibility of this approach.

Please explain the reference to the NRDA process in the last sentence.

Response: Comments noted and text modified.

19. Section 9.1.1, p. 9-7, para. 1: Please define the "complete data validation" mentioned in the last sentence.

Response: Text has been modified.

20. Section 9.1.2, pg. 9-7, para. 4: The RFI/RI Phase I scope indicated in this paragraph exceeds that defined in the IAG.

Discuss in detail coordination of the EE with the Phase I abiotic sampling program.

Explain how the "Additional soil sampling locations and procedures" will be accomplished. this sampling does not appear to be part of Task 9.

Response: The planning for the Phase II sampling in included in this EE. The relationship of Phase I to Phase II sampling is a continuous process.

21. Section 9.1.2, pp. 9-7 & 9-8, para. 5: The statement to the effect that "present information is not verified" and its relationship to the incomplete nature of the summary tables is not clear. The next sentence beginning with "In these tables" needs editing.

Response: Comment noted and text has been modified.

22. Section 9.1.2, pg. 9-8, para. 1: Explain what "incompatibility of process wastes with the pipe and tank materials" is and how this led to releases to the environment.

Provide support to the strength of the information leading to the position that volatile and other organics groundwater contamination "have not been related to the OPWL releases."

Statements to the effect that lateral and vertical extent of the contaminant release "...is expected to be confined to the trenches and adjacent fill material and soil" and that the FSP for site characterization in Section 7.0" ..."is expected to be sufficient for the EE purposes" have not been adequately supported, and should be removed in they cannot be supported.

Response: This information was developed in previous work and was used in the EEWP verbatim.

23. Section 9.1.2, pg. 9-8, para. 3: This information needs to be discussed in the context of a conceptual site model.

Response: The conceptual site model was developed as a general model in Section 2 of the RFI/RI Work Plan.

24. Section 9.1.2.1, p. 9-8, entire section: this discussion of COCs should be integrated with the discussion of COCs in section 9.2.1.4.

Response: This integration was not attempted due to the time frame for responses.

25. Section 9.1.3.1, pg. 9-10, entire section: This material should be presented in the framework of a conceptual model, and should include a map(s) of OU9 characteristics.

Response: The conceptual model in Section 2 was general, and information was not available for mapping OU9 biotic characteristics.

26. Section 9.1.3.1, pg. 9-10, para. 1: Whether the weed control measures introduced herbicides into the soils at OU9 and whether these contaminants are candidates for COC status should be stated.

Deer mice and house mice are two-word common names.

Use of abbreviated common names such as "cottontails" should be avoided.

Response: Comments noted and text modified. Use of herbicides is unknown on OU9, but will be evaluated.

27. Section 9.1.3.1, pg. 9-10, para. 3: The basis that a determination of whether or not contamination "is expected" will be made should be explained.

Discuss the total extent of existing natural habitat in terms of surface area, the portion of the existing natural habitat that may be contaminated due to OU 9 sources, and whether or not the potentially contaminated natural habitat is extensive enough to cause significant adverse effects in populations of key receptors.

The statement beginning with "Due to the nature..." is not clear.

Response: Comment noted, but no response due to time frame.

28. Section 9.1.3.1, pg. 9-11, para. 1: Indicate that the "thorough and systematic survey" may be conducted, if needed.

Response: Comment noted, and it is assumed a need for this survey exists.

29. Section 9.1.3.2, p. 9-11, para. 2: Please name some of these taxa or cite a table that includes them.

Response: These taxa have not been completely identified.

30. Section 9.1.3.3, pg. 9-11, para. 4: Preble's meadow jumping mouse may have recently been found along Woman Creek. Please update this information.

Response: Comment noted and text has been modified.

31. Section 9.1.3.3, pg. 9-12, para. 1: The forktip three-awn has been collected recently just south of the railroad tracks near the west gate.

Provide some discussion of the adequacy of the "recent survey" that supports the absence of these species of special concern at RFP.

Response: Comment noted and text has been modified.

32. Section 9.1.3.3, pg. 9-12, para. 2: The relationship of these wetlands to OU9 should be described. Are they along potential exposure pathways?

Response: These wetlands have not been evaluated or described.

33. Section 9.2, pg. 9-12, para. 3: Explain how the "procedures are intended to reduce the uncertainty..."

Response: Comment noted; reduction in uncertainty is a general objective of the whole EE process.

34. Section 9.2.1, pg. 9-12 & 9-13, para. 5: All of these activities should have been conducted as part of the work plan development.

Emphasize how the coordination of the EE with other studies should be based on a detailed conceptual model for OU9.

These "decision points" should be described in some detail. They can be very valuable in limiting the scope of the overall EE effort.

Response: Comments noted; work plan development activities and decision points are an integral part of the EE and are described throughout the document. the

35. Section 9.2.1.1, pg. 9-13, para. 1: this section identifies the need for coordination and integration of data collection activities with the other RFI/RI work and other OUs. However, the management plan and protocols for realizing this coordination and integration are not discussed. The reviewers recommend that DOE (1) define how the integration and coordination within and among OUs will be achieved, and (2) ensure consistency in technical approach in all of the EEs at RFP.

The statement that "The COCs for the OU9 EE will be used to suggest surveys,..." needs to be stated more clearly.

The discussion of "Environmental pathways for fate and transport of contaminants..." should be framed within the conceptual model for OU9.

Response: Comments noted and will used where appropriate.

36. Section 9.2.1.2, pg. 9-13, para. 2: the "time frame and boundaries of the study area" are not clearly stated, particularly their relationship to "seasonal biological sampling." Please clarify.

Response: The parameters of time and space boundaries are not defined at this point, but depend on Phase I sampling and site characterization.

37. Section 9.2.1.3, pg. 9-13, para. 3: Data quality objectives cannot be developed until data gaps are identified, preferably in the context of the conceptual model.

Change "primary objective" to "ultimate objective."

We suggest deleting the reference to "preliminary DQOs."

Response: Comments noted and text modified as appropriate.

38. Section 9.2.1.3, pg. 9-14, para. 1: The identification of data gaps should be added to this paragraph.

The last sentence in this paragraph should be clarified.

Response: Comments noted, but not implemented due to time frame.

39. (This number was skipped)

Response: None

40. Section 9.2.1.4, pp. 9-14 & 9-15, para. 2: Move the fourth sentence beginning with "The list identified..." before the second sentence beginning with "A complete list..."

If the initial list of COCs is to be developed herein, as indicated under "Occurrence," then the Phase I abiotic data must be available. Please discuss this sharing of data.

The first and third bullet items under "2. Ecotoxicity" are related and somewhat redundant. Please make sure they are distinct to merit separate bullets.

Under "3. Extent of Contamination" the indication is that this will be based on the historical data, and not the Phase I abiotic sampling data. If this is true, COCs cannot be identified.

The reference to the "Annual Background Geochemical Characterization Report" for RFP is not exactly correct, and the information included therein may not meet work plan needs.

Define how "present above" is defined, quantitatively.

Explain how the criterion for "reported in greater than five percent of the samples" is applicable to naturally occurring contaminants, which will be reported for virtually every sample.

Discuss the Phase I soil sampling work that is being conducted at OU9 to identify "hot spots."

Response: Comment noted and text modified as appropriate.

41. Section 9.2.1.4, pg. 9-16, para. 1: The statement regarding biotic populations that "can be measured by

contaminant concentrations" is not clear.

The statement that these ecosystems show "the absence of species in higher trophic levels" is not clear. Certainly there are herbivores there. If no carnivores is implied, please make explicit.

Response: Comment noted and text modified as appropriate.

42. Section 9.2.1.4, pg. 9-16, para. 2: Describe the potential uses of the reference area, in quantitative terms.

The basis for a decision on whether or not a reference area for OU9 will be required should be included.

The implication is that, at most, only one reference area will be identified. A single reference area will not be very useful.

Response: The use and need for a reference area is discussed in the FSP.

43. Section 9.2.1.5, pg. 9-16, para. 3: The bullet items do not include all the components of the conceptual model. Based on this model, inter-OU dynamics would not be considered, since they represent inputs-output relationships of OU9.

The last bullet item should be deleted. It is not part of the conceptual model.

Response: Comment noted and text modified as appropriate.

44. Section 9.2.1.5, pg. 9-16, para. 4: The reference to "Other models" that may be used to compare values of contaminant target analytes measured in environmental media to concentrations in biological tissue" is not clear. This should be part of the overall conceptual model. Plants are media for herbivores, and herbivores are media for carnivores, etc. All these interactions are properly part of the site conceptual risk model. DOE is erring in segregating the food web model from the overall site model.

Response: Comment noted; these relationships between food webs and conceptual model are known to the authors of this EEWP, and will be incorporated into implementation.

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45. Section 9.2.2, pg. 9-16 to 9-21, entire section: Stress the importance of the developing conceptual model as the framework for Task 2 activities, and the interaction of the two tasks (as shown in Figure 9-1).

Add a reconnaissance survey (including a limited pilot study) to collect the data needed to complete the preliminary (screening-level) risk assessment.

Whether the necessary information is going to be available to select the COCs according to criteria should be stated.

We suggest changing the focus of the preliminary risk assessment to one of a screening-level assessment used to eliminate soil related exposure pathways from further consideration.

The use of "functional groups" is good, and represents a more realistic approach to trophic based studies.

A decision point for proceeding with the (EE) at OU9 should be defined no later than the completion of Task 2 activities.

Response: Comments noted and text modified as appropriate; the reconnaissance survey is included in the qualitative surveys planned in the FSP.

46. Section 9.2.2, p. 9-16, para. 5: Item 2 indicates that data on the nature and extent of contamination will be available for Task 2 activities. Please describe the relationships between Task 2 and past or ongoing RI activities related to abiotic sampling, and the relationship between Task 2 and Task 3 sampling activities. Also, describe how the data on the nature and extent of contamination will be used to design the Task 3 activities.

Response: Comment noted, but text was not modified due to extensive revisions suggested.

47. Section 9.2.2, p. 9-17, para. 1: Discuss where the final selection of contaminants of concern and target biota taxa will be conducted, and cite the specific task and work plan section.

In general, discuss the central importance of the availability of information on the nature and extent of contamination in conducting these integrated Task 2 & 3 activities.

With reference to the third bullet, discuss the attributes of these plant and animal species that will be characterized.

"Information" is too nebulous, be specific about what population characteristics will be studied.

Response: Comments noted, but text was not modified due the extensive changes suggested.

48. Section 9.2.2.1, pp. 9-17 & 9-18, para. 2: the bullet item for "Phase I data base" is not clear. Does this include the results of Phase I soil sampling? This is an important point. Please be specific.

Response: The Phase I data base does not include Phase I sampling: this response was not incorporated into the text.

49. Section 9.2.2.2, pg. 9-18, entire section: Please define the relationship of these activities with Phase I abiotic sampling, including the availability of Phase I soil data. Present these relationships in the context of the developing conceptual ecosystem model.

Explain how the Task 3 information "... will be used in the pathway analysis and exposure assessment portion of the ecological risk assessment.

Add "Aquatic Ecosystems" as a bullet item. Thus far, sufficient information has not been presented to exclude it from consideration.

Response: Comments noted, but text was not modified due to time frame and extensive revisions needed.

50. Section 9.2.2.2, pp. 9-18 & 9-19, para. 3: We suggest focusing this discussion in terms of acquiring data for the screening level risk assessment.

Response: Comment noted, but text was not modified due to the time frame.

51. Section 9.2.2.2, pg. 9-19, para. 1: Discuss the scheduling of the EEs at other OUs (i.e., OUs 1, 2, and 5) in greater detail, including the availability of the data for OU9 Task 2 activities.

Response: Comment noted, but text was not modified due to time frame.

52. Section 9.2.2.2, pg. 9-19, para. 2: The reference to "...an on a general trophic-level model" is not clear.

The last sentence in this paragraph (beginning with "Based on the model..." is confusing and should be clarified.

Response: Comment noted, but text was not modified due to time frame.

53. Section 9.2.2.3, pp. 9-19 & 9-20, para. 4: We suggest focussing this discussion in terms of conducting a screening level risk assessment, the results of which can be used to determine the need for Task 3 activities.

The sentence stating that "Preliminary assumptions will be formed and the conceptual pathway will be used and tested." is confusing and should be clarified.

Response: Comment noted, but text was not modified due to time frame.

54. Section 9.2.2.4, pg. 9-20, para. 1: The potential contaminants discussed in the first sentence must be developed with due consideration of the results of the Phase I soil sampling. In this light, it is difficult to see the value in developing this preliminary list of COCs. This work should not be undertaken until the Phase I data are available.

Response: This preliminary list was included based on present information. It will be modified as sampling data is generated.

55. Section 9.2.2.4, pg. 9-20, para. 2: Describe the approval process for the EG&G criteria for target biota.

The phrase "economically important in other ecosystems" should be explained.

Response: Comment noted, but text was not modified due to time frame.

56. Section 9.2.2.4, pg. 9-20, para. 3: The use of reference areas is probably not feasible, given the disturbed nature of the OU9 habitat.

The statement in the first sentence about available information being "insufficient to do so" needs clarification.

Response: It is agreed that reference areas may not be needed and this is reflected in the text in other sections.

57. Section 9.2.2.5, Figure 9-3: Establishing a decision process is a good one, but it is based solely on feasibility. It should reflect the results of the screening level risk assessment.

With regard to feasibility, DOE should define the criteria upon which decisions will be made regarding "no acceptable method to study effect exists" and "no measurable effect expected at ecosystem level."

Response: These decision processes will be tested and modified as necessary during the implementation of the EE.

58. Section 9.2.2.5, pp. 9-21, entire section: Describe how the DQOs to which the FSP will be consistent were developed. This process has not been described in enough detail. Section 9.2.1.3 introduced DQOs, but the process needs to be laid out in detail.

Explain how the "...overall sample design will be consistent among tasks."

Response: The sections on DQOs has been modified.

59. Section 9.2.3, pg. 9-21, entire section: The specific objectives of the Task 3 field investigations should be provided.

The fact that the air program is site-wide and not OU9-specific needs to be made clear.

If the Phase I RFI/RI activities for abiotic media will cover surface water and ground water, this is beyond the scope laid out in the IAG.

Response: Comments noted, but text was not modified due to time frame.

60. Section 9.2.3.1, pg. 9-21, para. 5: We suggest restating the purpose of the site characterization program to better reflect quantitative risk assessment. "Validating conceptual models" is a somewhat strange way of stating this purpose.

Response: Comment noted and author agree, but text was not modified due to time frame.

61. Section 9.2.3.1, pg. 9-22, para. 1: Data from the site-wide air quality monitoring program should be used during Task 2 to conduct screening level risk assessment. These data exist as historical data, and are fair game for Task 2 activities.

Response: It is agreed that the monitoring programs will be useful, and these data will be used in the screening level risk assessment.

62. Section 9.2.3.1, pg. 9-22, para. 3: Justify that the Phase I soil sampling program is adequate for ecological characteristics.

Response: This sampling program includes soil sampling and parameters, including surface that should be adequate for the ecological characterization given the disturbed habitats present.

63. Section 9.2.3.1, pg. 9-23, para. 1: The first sentence indicating that the Phase I RFI/RI field investigations will be reviewed and modified as necessary" is not clear. Please elaborate on this important issue.

Response: Comments noted, but extensive discussion on this important point not attempted.

64. Section 9.2.3.1, pg. 9-23, para. 2: The last sentence indicating that "Sediments in OU9 are not extensive and are not of concern for the biota" needs to be adequately supported and justified.

Response: This will be justified in detail in the EE.

65. Section 9.2.3.1, pg. 9-23, para. 3: This "Ground Water" discussion is incomplete. The data mentioned herein should be synthesized in Task 2 in the context of the developing conceptual model.

Response: The ground water is discussed in greater detail in Section 2.

66. Section 9.2.3.2, p. 9-24, entire section: For each subsection, discuss what will be done with the data, why will each data type be collected, and how these data will be used in impact or risk assessment.

Response: Comment noted, but text was not modified due to extensive revisions necessary.

67. Section 9.2.3.2, pg. 9-24, para. 2: We suggest moving the initial qualitative survey (i.e., reconnaissance survey) to Task 2 (which together with Task 1 define scoping activities, and possibly increasing the scope of the survey to one of a pilot study.

The statement regarding "Detailed and quantitative field investigations, if needed, are planned..." should be expanded.

Where the "additional abiotic sampling" whose needs arise from the Task 3 efforts will be conducted should be explained.

Response: Comments noted, but text was not modified due to time constraints.

68. Section 9.2.3.2, pg. 9-24, para. 3: These objectives should apply to terrestrial vegetation and wetlands vegetation.

A subsection should be inserted following this paragraph addressing the methods for Terrestrial Vegetation.

Response: These sections are clarified in the FSP.

69. Section 9.2.3.2, pg. 9-24, para. 4: The relationship of these wetlands to OU9 is not clear. Present this information in a figure based on a conceptual model.

Response: It is premature do develop this detailed a conceptual model.

70. Section 9.2.3.2, pp. 9-24 & 9-25, para. 5: The objectives given for Terrestrial Wildlife sampling should have been largely accomplished during Task 2. We see nothing described herein or in the following paragraph that could not be accomplished in Task 2.

Response: This is handled in the FSP, Subsection 9.3.

71. Section 9.2.4, p. 9-25, entire section: Start this discussion with a summary of the information that is available at the initiation of Tasks 4-7. The relationship of Tasks 4-7 to the data/information collection activities should be clarified.

Response: Comment noted, but text not modified due to time constraints.

72. Section 9.2.4, pg. 9-25, para. 4: Much of what is described herein should be accomplished during Task 2.

The adequacy of "existing environmental criteria" for this assessment should be discussed.

Indicate that the preliminary (screening level) assessment in Task 2 will also determine the need for Task 9 ecotoxicological field investigations.

Response: The authors agree with these comments, but the text was not changed due to time constraints.

73. Section 9.2.4.1, pg. 9-26, para. 1: This sounds like the quotient method of ecological risk assessment. If this is true, please state as such clearly.

The difference in RFDs and EPA critical toxicity values need to be clarified.

Response: Comments note, but text not modified due to time constraints.

74. Section 9.2.4.1, pg. 9-26, para. 2: The feasibility of using "ecological endpoints" or "biomarkers" is questionable. DOE should consider incorporating in task 2 a pilot study to gain the information needed

to assess the feasibility of this approach. Are these studies to be part of Task 4, or are they to be conducted later (e.g., under Task 9)?

Explain how DQOs will be developed for these data collection activities.

Response: Comments noted, and author agree to the suggestions.

75. Section 9.2.4.2, pp. 9-26 & 9-27, para. 3: All three subtasks defined herein for Task 5 could be conducted to some degree in Task 2, especially if data from Phase I abiotic sampling is available. This is particularly true of the identification of exposure routes and pathways, which should have been developed as part of the OU9 conceptual model.

Response: Task 5 and Task 2 are not conducted separately, but may be done concurrently as suggested.

76. Section 9.2.4.2, pg. 9-27, para. 1: The qualitative evaluation of actual or potential pathways is a Task 2 activity.

Response: Comment noted; this evaluation will also be part of Task 2.

77. Section 9.2.4.2, pg. 9-27, para. 2: this paragraph should be clarified with reference to modeling of exposure pathways. Explain this procedure in greater detail since it is so important to the EE.

Response: Comment note, but text was not modified due to time constraints.

78. Section 9.2.4.2, pg. 9-27, para. 3: Much of this work should be accomplished in Tasks 1 and 2.

Explain the use of fate and transport modeling to this assessment. Modeling is not needed for current conditions.

The indication is that Phase I abiotic data may or may not be available. This is not acceptable. This EE should not progress beyond Task 2 without Phase I abiotic data for soils.

Response: Comments noted and agreed; text not modified.

79. Section 9.2.4.2, pg. 9-28, para. 2: The first sentence is incomplete.

Clarify these direct an indirect routes. Why is foliar deposition an indirect route for the plant receiving it? For a predator, a prey is a biological medium and the consumption of the prey is direct. Please clarify this.

Clarify the meaning of the sentence beginning with "Exposures will be evaluated according..."

Explain the meaning of the last sentence (beginning with "A pathways model...") and how this will be accomplished.

Response: Comments noted, but no response due to time frame.

80. Section 9.2.4.2, pg. 9-28, para. 4: The adverse biological effects mentioned herein (e.g., death, diminished reproductive success, reduced population levels) are very likely not useful at OU9 because of the small size and disturbed nature of the habitat.

Response: The authors agree, and this is stated in the EEWP.

81. Section 9.2.4.3, p. 9-28, entire section: This approach represents a major departure from the standard "quotient method" of ecological risk assessment, and the methodologies should be presented in detail, including assessment endpoints, measurement endpoints, hypotheses to be tested, and how will these data be provided.

Discuss the implications of the qualitative nature of this characterization of adverse effects, including what can and cannot be done.

Response: Comments noted; the qualitative/quantitative approached will be clarified.

82. Section 9.2.4.3, pg. 9-29, para. 2: There is question whether or not this approach is feasible at OU9. We suggest that DOE collect the data needed to judge this feasibility issue in a pilot study under Task 2.

Response: Comment noted.

83. Section 9.2.4.3, pg. 9-29, para. 3: This entire paragraph is weak and needs reworking.

Response: Comment noted, but text not modified due to time constraints.

84. Section 9.2.4.4, pp. 9-29 & 9-30, para. 4: Relate this uncertainty analysis to the SQO process, particularly regarding the "level of confidence by quantifying the results of the assessment."

The first and third bullets are virtually the same.

Response: Comments noted, and text changed as appropriate.

85. Section 9.2.4.4, pg. 9-30, para. 1: Explain how the "validation and calibration of the pathways model" will be used to control uncertainty.

Response: This discussion was not attempted due to time constraints.

86. Section 9.2.5, pg. 9-30, para. 3: Does an SOP exist for soil microbial function?

Response: No.

87. Section 9.2.5, pg. 9-31, para. 1: The reference to "program DQOs" is not correct. DQOs are specific to specific data needs.

Bullets 2 and 4 should be defined in terms of PARCC parameters. These two bullets should be addressed in a Task 2 pilot study.

Response: Comments noted, but no response due to time frame.

88. Section 9.2.5, pg. 9-31, para. 3: Incorporate a discussion of the use of clear statements of hypotheses to be tested in defining these data needs.

Type I and II errors in the last bullet item should be explicitly defined.

Response: Comments noted, but no text change due to time frame.

89. Section 9.2.5, pg. 9-32, para. 1: It is not clear how Task 9 activities (planned in Task 8) can be conducted simultaneously with Phase I RFI/RI abiotic sampling activities. The EE should never proceed to this stage

without the benefit of the Phase I RFI/RI abiotic sampling activities.

Explain how published, predicted, or investigation derived BCFs will be used in the pathways model to assess potential impacts.

Response: Comments noted, but no response in text due to time constraints.

90. Section 9.2.6, pg. 9-32, para. 5: Add "and appropriate" to the end of the second sentence (beginning with "Reference areas will be sampled...").

Response: Text not changed due to time constraints.

91. Section 9.2.7.1, pg. 9-33, para. 2: We suggest moving this paragraph (i.e., everything down to the start of Section 9.2.7.2) after Section 9.2.7.2 and call it Section 9.2.7.3, *Content of the Initial Draft Report.*

Response: Text was not changed due to time constraints.

92. Section 9.2.7.2, p. 9-33, entire section: this discussion of remediation criteria, and the use of the pathway trophic model for establishing remediation criteria has not been properly introduced. Discuss the validation methodology and how this model will be used to assess impacts.

The methodology for establishing ecological effects criteria should be discussed in greater detail. Also, how the methodology takes into account exposure to multiple contaminants should be discussed.

Discuss the feasibility of this methodology in light of the existing toxicological data base and the prospects for collecting tissues in quantities sufficient for chemical analyses.

Discuss how determination of these criteria for OU9 will be coordinated with other RFI/RI studies and EEs, and how the acceptable criteria will be used in conjunction with Applicable or Relevant and Appropriate Requirements (ARARs) to evaluate potential adverse effects.

Response: Comments noted, but no text change due to time constraints and the extensive revisions suggested.

93. Section 9.2.7.2, pp. 9-33 & 9-34, para. 3: Task 10 is too late to be developing remediation criteria. At the very least, they should be developed in Task 9.

The development of remediation criteria should utilize data from all OUs, as available. This discussion should reflect this need for sharing of information.

The "acceptable environmental concentrations" need to be clarified.

Response: Comments noted and agreed, but text was not modified.

94. Section 9.3, pp. 9-34 to 9-42, entire section: Include consideration of Task 2 reconnaissance and pilot studies to acquire the information needed for screening level risk assessment and the design of Task 3 and 9 sampling efforts, as required.

Discuss the role of information on the nature and extent of contamination (and particularly the results of the Phase I sampling of abiotic media contamination) in the design of the field sampling plan. Provide the general rationale underlying the selection of sampling stations.

Describe the types of quantitative data to be collected during this sampling effort.

DOE should also stress the use of these quantitative data to establish samples sizes for acceptable levels of uncertainty.

Define the criteria for determining and adequate number of transects and how this will be implemented in the field. Discuss whether or not adequacy based on a species-area type relationship, or an acceptable level of variability for a population parameter (e.g., density) or community measure (species diversity).

Response: Comments noted, but text was not modified due to time constraints.

95. Section 9.3, pg. 9-34, para. 2: Change "Tasks 8 and 9" to Tasks 3 and 9."

Response: This change is not indicated by context.

96. Section 9.3, pg. 9-34, para. 3: Discuss the use of Phase I data for abiotic media in designing this FSP.

Response: Comment noted, but text was not changed.

97. Section 9.3.1, pg. 9-35, para. 1: This information is quite repetitive of earlier sections.

Response: The authors agree, but is required by FSP context.

98. Section 9.3.1.1, pg. 9-35, para. 3: This information is quite repetitive of earlier sections.

Response: The authors agree, but is require by FSP outline and context.

99. Section 9.3.1.1, pg. 9-35, para. 4: This information should be shown via a conceptual model and maps.

Define the basis of determining the "OU9 study area boundaries." Is this based on some "zone of influence" reflected in the nature and extent of contamination?

Consider using another term than "vagrant" to describe biotic users of OU9.

Response: Comments noted, but text was not changed.

100. Section 9.3.1.2, pg. 9-36, para. 1: How will decisions be rendered regarding whether or not specific sites within the study area are "determined to be of concern?"

With regard to the second bullet, how will "the exact extent of the area of concern" be determined?

The last statement, beginning with "Notable differences..." is weak. It should include something of consequence.

Response: Comments noted, but text was not changed.

101. Section 9.3.2, pg. 9-36, para. 3: The second objective is not entirely consistent with the other three (apples and oranges), and we suggest deleting it.

Response: Comment noted, but text was not changed.

102. Section 9.3.2, pg. 9-36, para. 4: We suggest not using the term "preliminary list of COCs." It is misleading. Until Phase I abiotic data are evaluated, any listing of COCs is pointless.

Response: Comment noted, but text was not changed.

103. Section 9.3.2, pg. 9-37, para. 1: Indicate the possibility that aquatic habitats and taxa may be important.

Target taxa could be identified on the basis of Task 2 activities.

Response: The authors do not agree that aquatic habitats and taxa are important on OU9.

104. Section 9.3.3, pg. 9-37, para. 4: The sentence beginning with "Aquatic habitats not represented..." is not correct and should be clarified.

Response: The authors do not agree.

105. Section 9.3.3.1, pp. 9-37 & 9-38, para. 5: Explain how "the study are will be finalized."

Response: Comment noted, but text was not modified.

106. Section 9.3.3.1, pg. 9-38, para. 1: Explain how the bullet items are to be used to meet the objective of constructing an OU9 food web and exposure pathways models. Explain what use these data are if they are not quantitative (see comment 108 below).

Response: Comment noted, but text was not modified.

107. Section 9.3.3.1, pg. 9-38, para. 2: Sample locations should be based on the nature and extent of soil contamination, particularly if food web methods are to be employed. These locations should not be identified "during the initiation of this study." The necessary information base is not available at this time.

Response: The sample location will be mostly based on the habitat conditions present on OU9.

108. Section 9.3.3.1, pg. 9-38, para. 3 (Collection Methods): This paragraph indicates that the collection methods for vegetation will be nonquantitative. The use these data are to impact or risk assessment should be explained.

Response: The use of quantitative methods may not be justified in this disturbed habitat.

109. Section 9.3.3.1, pg. 9-39, para. 1: This discussion is too diffuse. It should be much more focussed and directed at filling key data gaps. Use of 0.5 m^2 plots appears to be quantitative. This appears to be inconsistent with earlier statements.

Response: Comment noted, but text was not modified.

110. Section 9.3.3.1, pg. 9-39, para. 2: The use of species area curves to assure adequate sampling effort for vegetation taxonomy is applauded.

Change "climate" to "weather."

The statement that Task 9 sampling occurring "...immediately after Task 3 sample results are analyzed for completeness for modeling" is inconsistent with the conduct of Tasks 4-8 prior to Task 9. This apparent contradiction should be resolved.

Response: Comment noted, but text was not modified.

111. Section 9.3.3.1, pg. 9-39, para. 3: It is our understanding that the Quality Assurance Project Plan (QAPjP) does not define duplicate samples as "collocated" samples, but as splits of field samples. Please clarify.

Response: The use of duplicate vs collocated samples has not been decided.

112. Section 9.3.3.1, pp. 9-39 & 9-40, para. 5: The three bullet items are not feasible endpoints for impact assessment. Please reconsider their use.

Response: Comment noted, but text was not modified.

113. Section 9.3.3.1, pg. 9-40, para. 3: This methodology for locating vegetation transects in areas of known contamination assumes these areas of known contamination are known. This requires the Phase I abiotic data. It is our understanding these data may not be available to serve this function in a timely manner.

The circumstances under which composite samples would be required should be described. Why six samples were specified for the composite samples needs adequate justification.

The statement that tissue sampling will occur after the conclusion of the live-trapping program is confusing. Do the tissue samples not derive from the live-trapping?

Response: Comments noted, but text was not modified.

114. Section 9.3.3.1, pg. 9-41, para. 3: The bullet items will be of no value to impact or risk assessment.

Response: These are site characterization parameters.

115. Section 9.3.3.1, pg. 9-41, para. 5: Whether or not enough insect biomass can be obtained should be determined during a Task 2 pilot study.

Response: The authors agree, however the Task 2 pilot study is the same as the initial qualitative studies proposed here.

116. Section 9.4, pg. 9-43, para. 1: With regard to "decision points for the necessity for a task" which have not yet been determined should be. We have made suggestions regarding these decision points (i.e., the end of Task 2, after a screening level risk assessment).

Response: The decision points have been noted and will become part of the EE implementation.

RESPONSES TO HAZWRAP COMMENTS
DRAFT FINAL PHASE I WORK PLAN FOR OPERABLE UNIT NO. 9

GENERAL COMMENTS

1. The work plan contains a generic discussion of the risk assessment process, but contains no specific plan for conducting the baseline risk assessment for the operable unit. Site specific information should be incorporated into the plan when available. For instance, elements of the site model such as potential pathways and site-specific exposure factors can be identified in the planning stage.

Response: The Risk Assessment section of the work plan is generic. Potential pathways and site specific exposure factors may be determined during the data collection/evaluation phase. Since only surface soil will be characterized in Phase I, this limited scope does not lend itself to a site specific approach to the risk assessment.

2. The plan contains no provisions for integrating the ecological risk assessment with other operable units at the Rocky Flats Plant (RFP). Such an approach is essential for addressing ecological risk on a site-wide basis.

Response: The OU9 Environmental Evaluation Work Plan (EEWP) is consistent with the current approach of preparing EEWPs independently for individual RFP OUs. The EEWPs for the various OUs will be integrated at a later date in order to address ecological risk on a site-wide basis.

3. The sampling plan is not consistent with the approach for estimating exposure point concentrations presented in the human health risk assessment plan. Because of the scope of the operable unit and the likelihood of the occurrence of hot spots along the pipeline, a plan for addressing this distribution of contamination needs to be developed.

Response:

4. The site conceptual model, data quality objectives, data needs and sampling plan are not presented in a connected fashion. The data quality objectives should reflect the gaps in the conceptual model where information is required in order to make a remedial decision.

Response: It was assumed during development of the OU9 DQOs that no useable information existed which could help focus the field investigation. It is acknowledged, however, that such information may exist which was not available during preparation of the work plan. This information will be compiled and evaluated prior to the field investigation, and the field investigation will be revised as appropriate.

5. The final disposition of the tanks and lines should be provided. This information could then be incorporated into the screening and analysis of remedial alternatives.

Response: The known disposition of tanks and lines is provided in Appendix B. For the most part, the current disposition of pipelines remains to be determined through additional data compilation and/or excavation and inspection.

6. The data management plan, health and safety plan, and quality assurance plan should be included or

referenced.

Response: The data management plan is addressed in Section 7.5 to the extent that it is considered appropriate in this work plan. The QA plan is referenced in Sections 4.3 and 10.0. The site-specific health and safety plan will be developed by the contractor that actually conducts the OU9 RFI/RI.

7. The plans to track, store, and treat any contaminated soils that may have been excavated and removed from OU9 should be described in the field sampling plan (FSP).

Response: SOPs which address these concerns have been incorporated by reference into the FSP.

8. A major component of the FSP includes installation of boreholes drilled either to bedrock or to the zone of saturation. Drilling and sampling boreholes is a necessary component of the contaminant characterization study; however, such boreholes can result in contamination of groundwater in the saturated zone. Placing boreholes that extend to the saturated zone and through zones of chemical and radiological contamination, create potential conduits for ground water contamination. We suggest that plans be developed to minimize the risk of groundwater contamination. If such plans exist, they should be described in the FSP.

Response: SOPs which address these concerns have been incorporated by reference into the FSP.

9. The risk assessment plan states that the risk assessment will not go to great lengths to quantify dermal exposures because this pathway is not expected to contribute significantly to risk at the site. Dermal exposure should be quantified at this site. Soil concentrations are likely to be high in areas adjacent to leaks along the pipeline, and dermal exposure could be significant under a construction worker scenario.

Response: Text has been modified to reflect suggestion.

10. "PRP" and "CWQCC" should be included in the "List of Acronyms."

Response: PRP already was included in the List of Acronyms. CWQCC has been added.

SPECIFIC COMMENTS

1. Executive Summary: This section does not provide a summary of information presented in the work plan but simply an organization of the report. The summary should provide an outline of how the investigation will proceed, i.e., the digging of test pits, collection of samples, investigating the integrity of the lines and tanks, etc.

Response: The scope and content of the executive summary is consistent with those for other RFP OU work plans, and is considered an appropriate summary of the document contents.

2. Section 1.2, p. 1-3, paragraph 1: The detail with regards to the qualities added on the data evaluation process does not need to be included in this section. The important information include the data that have been considered usable.

been considered usable.

Response: This information is considered valuable in order to understand the data presented in Appendix D.

3. Section 1.3.3.5, p. 1-7: The statement that there are no vegetative species on the endangered list may no longer be defendable. The reviewers have been led to believe that there are endangered grass species on Rocky Flats Plant property.

Response: The ecological summary provided in Section 1.3.3.5 was considered accurate as of the date of submittal for the work plan. Newly developed background information which could impact this section or other sections of the work plan will be incorporated as it becomes available.

4. Section 1.3.3.5, p. 1-8, paragraph 1: Since specific species identifiers are used for all the other fauna, it seems appropriate to specify which duck species are present at Rocky Flats.

Response: The text has been revised in response to this comment.

5. Section 1.3.3.7, Regional Geology, Quaternary Deposits, p. 1-10: The work "above" in the sentence: "The alluvium occurs from 250 to 380 feet above modern stream drainages" should be clarified. We assume "above" is used in a simple spacial context as opposed to a stratigraphic context; however, we anticipate that the spacial distance between the stream channel and the alluvium approach zero up slope and towards the head of the stream valley.

Response: The distance referred to is stratigraphic thickness; the text has been clarified in response to this comment.

6. Section 1.3.3.7, Regional Geology, Upper Cretaceous Deposits, p. 1-12: The following statement should be clarified: "Its areal extent has been predicted to the two "Geologic Characterization Report" depositional interpretations discussed above.

Response: This typographical error has been corrected.

7. Section 2.2.2.2, p. 2-4: This section indicates that there was a great deal of control and documentation on the types, quantities and locations of hazardous materials transported and spilled. This information does not appear to have been properly analyzed. Incorporation of this information at this stage of the investigation would aide (sic) in determining sample locations.

Response: The waste transfer records referred to in this comment will be pursued as part of the additional data compilation activities which will precede the field investigation. The objectives and scope of the additional data compilation are discussed in greater detail in the text in response to this and other comments.

8. Section 2.2.4, p. 2-8, paragraph 2: The work plan should not include "recommendations" regarding the scope of the investigation. The work plan should describe the scope in precise terms. The decision to include, or exclude, sites from investigation should be made by another process prior to the writing of the work plan.

Response: Decisions regarding investigation of specific sites were made under the IAG between DOE, EPA, and

CDH. However, redundancy was identified during preparation of this work plan between the OPWL (OU9) and other, separately designated IHSSs which were actually part of the OPWL. The referenced passage recommends that these IHSSs be incorporated into OU9, but makes no recommendations regarding investigation of these sites.

9. Section 2.2.4, p. 2-8, paragraph 3: It is unclear why the investigators included a table designed to help clarify the interactions between the various investigations, and then stated that the sampling plan for this investigation would not attempt to coordinate with other investigations. We recommend that the relationship between the sampling presented in this plan be coordinated with the sampling conducted at other sites.

Response: The OU9 FSP is consistent with the current approach of preparing FSPs independently for RFP OUs without considering interactions with other OUs. The FSPs for the various OUs will be integrated at a later date. The table was included for this purpose.

10. Section 2.3.2.2, Bedrock Geology, Arapaho Sandstones, p. 2-12: The grain size qualifiers used in the text should be described. For example, on the Wentworth scale very fine sand is between 0.125 and 0.063 millimeters in diameter; however, ASTM standards used by engineers place the fine sands in the range 0.425 and 0.074 millimeters.

Response: Sources used to obtain grain size qualifiers and referenced in the text contain specific details on the grain size scale used.

11. Section 2.3.3.2, Ground Water, p. 2-14: The contour maps of the unconfined ground water surface are misleading for OU1, because there are wide areas where no unconfined groundwater exists ("Final Phase III RFI/RI Work Plan Revision 1, Rocky Flats Plant, 881 Hillside Area, EG&G, March 1991"). Isopach maps, that were contoured for the thickness of the unconfined saturated zone, indicated that the saturated zone consists of several isolated "puddles" of groundwater. Perhaps the investigators would benefit more from using both the contour map in Figure 2-6 and isopach maps based on the same data. This combination may provide more guidance concerning the depth to saturated conditions (i.e., to determine whether or not do unconfined saturated conditions exist at a particular location).

Response: As a result of seasonal variations, unconfined ground water levels at RFP fluctuate widely. Figure 2-6 was provided to give only a general indication of unconfined ground water conditions at RFP, and is qualified with a date to indicate the season represented by the data. Field investigators most likely will utilize the most current water level data from nearby wells in order to estimate depth to saturated conditions at particular OU9 locations.

12. Section 2.4.1, p. 2-18, paragraph 3: The reference regarding the disposal of volatile and semivolatile organics in the waste system should be presented.

Response: The reference has been provided in the text in response to this comment.

13. Section 2.4.3.2, p. 2-21: The title of this section should be changed to indicate that the presented groundwater data will not be incorporated in the analysis of OU9.

Response: The title of the section has been changed in response to this comment.

14. Section 2.5.2.1, p. 2-25, paragraph 5: The use of 500 gallons as a reasonable approximation of a release should be clarified. Gradual releases will likely result in contaminant plumes of a considerably shorter length.

Response: As stated in the text, 500 gallons is considered a reasonable typical release volume for purposes of evaluating hypothetical contamination spread down a pipeline trench. Additional data compilation activities will attempt to locate historical release information containing estimated release volumes, and the 500 gallon figure will be revised as appropriate; however, available documentation is most likely biased towards larger, more catastrophic releases, and smaller, more gradual releases may well have gone unrecognized. The text also acknowledges that gradual releases will result in a less preferentially aligned contaminant plume. The FSP has been designed to target the most likely release locations along the pipelines, whether gradual or more sudden in nature, and provides a reasonable, staged approach to characterizing the unit.

15. Section 3.0, p. 3-1: This chapter would benefit from a summary section that describes which requirements will be followed in this investigation.

Since this investigation does not include groundwater or surface water sampling, the inclusion of water standards does not appear to be necessary. A system to determine which requirements will be applied to soils since this is the focus of the investigation would be appropriate and should be included.

Response: RFP currently is assessing ARARs on a site-wide basis. The results of this assessment will be applied to the OU9 investigation as appropriate. The work plan provides only a preliminary assessment of potential ARARs for the RFI/RI, including those for ground water.

16. Section 4.1.2, p. 4-2, paragraph 1: The assumption that no data exists that can be used does not seem valid. The information already collected at other operable units in section 2 and appendix B, could do a great deal to focus this investigation. The existing data should definitely be utilized in developing the Data Quality Objectives (DQOs) and data needs.

Response: Very little data are available from other OUs which can apply to the development of DQOs for OU9. OU1 data will have some bearing on the investigation of pipelines and tanks immediately south of Building 881; most of these data are not yet available pending laboratory results. OU2 data are not relevant to any OPWL components. Field investigations of other OUs have not commenced at the time of this work plan. As stated in the text, the DQOs will be revised as appropriate in light of data obtained during additional data compilation activities.

17. Table 4-1: This table should include the use of field screening and air monitoring and the techniques to be used to locate the buried pipe system.

Response: Field screening and air monitoring will be utilized primarily for health and safety purposes, not for site characterization. Pipeline location is part of the unit characterization process which necessarily must occur concurrently with the investigation itself, not part of the investigation which requires consideration as a DQO.

18. Section 5.3.3.2, p. 5-4, paragraph 1: Excavation depth may not be an applicable parameter on which to base the sample locations. Other criteria such as those listed and historical spill information should take precedence.

Response: The text has been revised in response to this comment.

19. Section 5.3.3.2, p. 5-5, paragraph 4: In addition to smear samples, inside surface radiological dose rates would be valuable for future. This information would be useful in verifying process piping historical data and for future disposal criteria.

Response: Dose rates will be measured inside piping in response to this comment.

20. Section 5.3.4, p. 5-5: The contingency plans if areas are inaccessible should be described. These areas will need to be included in the site characterization in some manner.

Response: Access will be obtained to all OPWL components requiring investigation under the FSP; therefore, no contingency plan is necessary. The accessibility reference in this section has been removed.

21. Figure 6-1: This schedule is not complete. There is no time frame for development of the baseline risk assessment. Field Investigation should be broken into its component parts, and the screening of alternatives should be taking place in conjunction with the field investigation. By doing the screening in conjunction with the field investigation it may be possible to fill data needs screening during this phase of the investigation.

Response: Figure 6-1 schedule has been modified to reflect reviewer's comment.

22. Section 7.2, Background and Rationale, p. 7-1: It is stated that "this FSP has been developed under the assumption that no usable data are available to describe the contaminant sources and the soils in OU9," but that "historical data will be used to help focus the sampling effort." This statement seems to be a contradiction, please clarify the term data. We do not believe it is necessary to reject all previous data simply because the quality assurance/quality control procedures were not consistent with present RFP procedures. The data may be relegated to a level II status (qualitative status).

Response: The use of the term "data" has been clarified in the referenced section in response to this comment. As stated in the text, available data will be used qualitatively to help characterize the OPWL and define contaminants of concern.

23. Section 7.2.1, p. 7-2: The reference to Department of Energy (DOE) keeping the regulators informed by technical memoranda should be deleted.

Response: This statement has been removed in response to this comment.

24. Section 7.3.1: This information should have already been collected and presented in this work plan (i.e., this is consistent with a environmental restoration (ER) program Phase I, site investigation).

Response: It originally was intended that the OPWL Closure Plan would provide all information necessary for planning the OPWL field investigation. It became apparent during preparation of the work plan that the Closure Plan information was insufficient for this purpose. Potential additional sources of information were identified, but the information could not be reviewed and incorporated into the work plan within the IAG milestone schedule for OU9. For this reason, the additional data compilation activities described in Section 7.2.4 will be conducted prior to the field investigation. The text has been revised to better explain the need for additional data compilation.

25. Section 7.3.2, p. 7-6, paragraph 3: This is the first mention of a "prework radiological survey." Please clarify what this survey entails and how this information will be used.

Response: RFP SOP FO.16, "Field Radiological Measurements," spells out the scope and requirements of prework radiological surveys at borehole locations. This SOP is incorporated by reference into the FSP as appropriate. The survey is required solely for health and safety purposes, and is not a primary site characterization activity. However, the survey results may aid in site characterization by indicating areas of gross surficial contamination.

26. Section 7.3.2.1, p. 7-6, paragraph 5: "If practical, the test..." The identification of survey anomalies for the sampling plan is the purpose of the prework survey and needs to be a primary factor in the choice of a test pit location.

Response: See response to comment 25. The purpose of the prework survey is to identify areas of surficial contamination for health and safety purposes, not to aid in the investigation.

27. Section 7.3.2.2, Stage 2 Investigation: The precautions that will be taken to prevent contamination of groundwater should be specified. Also, the fate of the boreholes after sampling has been completed (reference SOP if appropriate) should be described.

Response: SOPs GT.2, "Drilling and Sampling Using Hollow-Stem Auger Techniques," and GT.5, "Plugging and Abandonment of Boreholes," are referenced in the text as appropriate in response to this comment.

28. Section 7.3.2.2, p. 7-7, paragraph 1: The pattern is not a grid pattern, please reword.

Response: The text has been revised in response to this comment.

29. Section 7.3.2.2, p. 7-7, 7-8, paragraph 2: The "5 and 20 foot intervals in both directions" should be clarified and related to Figure 7-4. There seems to be a discrepancy in this figure and what is stated in this section. The figure indicates a single 5 foot interval and additional 20 foot intervals. There are no indications as to the direction of the 5 foot interval samples and the criteria for the discontinuation of the 20 foot interval tests.

Response: As shown in Figure 7-4 and described in Section 7.3.2.2, Stage 2 pipeline soil borings will be drilled 5 and 20 feet from each contaminated test pit, <u>except</u> where two consecutive contaminated test pits occur, in which case borings will be drilled on 20 foot centers between the pits. The results of these Stage 2 borings will then be summarized in technical memoranda, along with proposed locations of additional (Stage "3") borings to further characterize sites found to be contaminated in Stage 2. Because conditions at individual pipeline release sites are unknown, this approach allows necessary flexibility in designing the FSP as information becomes available.

30. Section 7.3.3.2, Stage 2 Investigation, p. 7-11: If the groundwater is not examined, then the extent of the contamination plume cannot be defined. Perhaps it should be stated that the lateral extent of the plume will be defined. Also, in the event that contamination is found at the water table, the action that will be taken by the ER Program at RFP should be clarified.

Response: "Contaminant plume" has been reworded as "extent of soils contamination" in response to this and other comments. If contamination is found at the water table, the specific release site will be identified as a candidate for further characterization under the Phase II RFI/RI.

31. Section 7.5, p. 7-14: This section should reference a data management plan. This would appear to be particularly important for this investigation due to the nature of determining pipe and tank locations. How this information will be documented should be presented in this work plan or the data management plan referenced.

Response: Data management for the OU9 RFI/RI will be performed by the contractor that implements the work plan. Forms or other methods of recording the data will be developed by the implementing contractor.

32. Figure 7-3: The text includes a discussion on sampling below the water table. The figure does not show any sampling below the water table and should be clarified.

Response: The text has been revised in response to this and other comments to more fully address sampling below the water table both in pipeline test pits and tank soil borings.

33. Table 7.3: The title "SPLS" should be clarified and/or identify it in the "List of Acronyms."

"SPLS" is an abbreviation for "samples." This has been clarified by adding a period.

34. Table 7.3: The explanation "Not a valid OPWL tank location" should be clarified. A footnote indicating the reasons for exclusion would be helpful.

Response: The explanation of spurious (invalid) OPWL tank locations is provided in several places within the text. A footnote has been added to Table 7.3 to direct the reader to discussions of tank investigation decision rationale.

35. Figure 7-4: Perhaps additional samples should be taken to clearly identify the end of the contaminant plume. The 20 foot interval testing was stopped at the top of the plume before a non-contaminated sample was located.

Response: The contaminant plume depicted in this figure is purely hypothetical. See response to comment 29 for an explanation of Stage 2 sampling rationale.

36. Figure 7-5: The branch which requires an inspection of a tank that is beneath a production building should be clarified. There needs to be a contingency plan if the tank is totally inaccessible.

Response: As explained in the text, OPWL components beneath production buildings will not be investigated until the building is decommissioned, per agreement between DOE and regulatory agencies. If a tank is totally inaccessible due to an overlying production building, that tank will not be investigated under the OU9 RFI/RI, and no contingency plan is required.

37. Figure 7-6: Whether or not a soil sample be taken under the tank even though it is below the water table should be specified. This would be analogous to the sampling under the pipeline when it is under the water table (Section 5.3.3.2).

Response: The text has been revised in response to this and other comments to more fully address sampling below the water table both in pipeline test pits and tank soil borings.

38. Section 8.2.2, p. 8-3, paragraph 3: The "minimum- and maximum-reported concentrations" per sample should be clarified. An additional helpful parameter would be to include the depth spacing of the reported contaminants.

Response: It is felt that this text as written does not require modification.

39. Section 8.2.3, p. 8-4: The fourth bullet states "Contaminant can be attributed to RFP activities." The possibility of a contaminant that cannot be "officially" attributed to RFP but is definitely there needs to be addressed. This may identify a previously unreported contaminant.

Response: Change has been made.

40. Section 8.3.6, p. 8-10, paragraph 1: This paragraph makes reference to the "intake factor" and states that it is combined with the exposure point concentration and the critical/toxicity values. The reference is unclear and is not standard risk assessment terminology. A more appropriate and well-defined description of the generic risk assessment equation is needed.

Response: Change has been made and additional descriptions added to text.

Comment: P. 1-1, par. 2, line 10: Insert "(RFI)" after RCRA Facility Investigation.

Response: This change has been made.

Comment: P. 1-6, par. 3: Include more detail on wind speed and wind direction.

Response: A source reference for current climatological data has been included in the text.

Comment: P. 1-6: Include data on evaporation. This can be included in a separate par. including humidity (see page 1-7).

Response: A source reference for current climatological data has been included in the text.

Comment: P. 1-7, Sec. 1.3.3.4, par. 1: State the average flows or range of flow for these creeks.

Response: A source reference for this information has been included in the text.

Comment: P. 1-7, Sec. 1.3.3.4, par. 2: State that Rock Creek drainage has not been impacted by RFP activities.

The last sentence regarding the SID should be a separate par..

Response: The Rock Creek drainage has not been extensively characterized, and impacts due to past RFP activities are possible (for instance, winds may have dispersed fugitive dust to the drainage). However, no routine discharges to Rock Creek from RFP (such as those to Walnut and Woman Creeks) are known to have occurred, and environmental sampling results near Rock Creek are consistent with expected background concentrations. The text has been revised to include this information. Also, the SID information has been moved to a separate par..

Comment: P. 1-7, Sec. 1.3.3.5: Include a par. regarding species of concern (SOC) species at the RFP and the SOC species list from the threatened and endangered species Ecology SOP. For information, contact Bruce Hope, EG&G Rocky Flats, Inc. at 273-6230.

Response: Information on T&E species and pertinent SOPs was obtained from the EG&G NEPA group and incorporated into the text.

Comment: P. 1-12, par. 4: State that the Fox Hills Formation crops out west of the RFP and is not likely impacted by RFP activities.

Response: The text has been revised to include this information.

Comment: P. 1-13, par. 2: Insert "approximately" before the hydraulic conductivity values listed in the last

two sentences.

Response: These changes have been made.

Comment: P. 2-2, par. 2: Break the last two sentences on a computer search of catalogued drawings into a separate paragraph.

Response: This change has been made.

Comment: P. 2-2, par. 3, last sentence: The additional data compilation task is a scoping activity and should not be identified as a task in the work plan. The results of this task should be presented in this work plan. The NCP requires data compilation efforts to be completed prior to (remainder of comment did not transmit via FAX).

Response: It originally was intended that the OPWL Closure Plan would provide all information necessary for planning the OPWL field investigation. It became apparent during preparation of the work plan that the Closure Plan information was insufficient for this purpose. Potential additional sources of information were identified, but the information could not be reviewed and incorporated into the work plan within the IAG milestone schedule for OU9. For this reason, the additional data compilation activities described in Section 7.2.4 will be conducted prior to the field investigation. The text has been revised to better explain the need for additional data compilation. Also, the data compilation is no longer described as an RFI/RI task, but is planned to precede the RFI/RI.

Comment: P. 2-15, last par., line 3: Insert "approximately" before the hydraulic conductivity value.

Response: This change has been made.

Comment: P. 2-17, par. 1, line 1: See comment for p. 2-15, last par., line 3.

Response: This change has been made.

Comment: P. 2-17, par. 1, last sentence: How can this be acknowledged but not quantitatively defined: Reword or delete from text.

Response: The referenced passage has been reworded.

Comment: P. 2-17, Sec. 2.4.1: Are these chemicals listed in the closure plan based on the waste analyses described on page 2-4?

Response: The Closure Plan does not specifically reference the source of this information, but it likely is a very general summation of information from a number of sources, including employee interviews, previous OPWL studies, and general knowledge of RFP operations. Efforts will be made to obtain these waste transfer analyses during additional data compilation activities described in Section 7.2.4 prior to the field investigation.

Comment: P. 2-20, par. 3: Were release volumes calculated? If so, are the records available? State in text.

Response: Historical OPWL pipeline release documentation sometimes contain estimates of release volumes. These volumes typically represent the difference between quantity of waste shipped and quantity received. Additional data compilation activities will focus both on waste transfer records and historical release documents to better determine the range of volumes that typically were involved in known OPWL pipeline releases. If necessary, the conceptual model estimate of 500 gallons for a "typical" release will be revised. It is acknowledged in the text that reported release volumes will be biased towards larger, more catastrophic or sudden release episodes. The 500 gallon estimate is intended to take gradual, less voluminous releases into account.

Comment: P. 2-21, par. 1, last sentence: This is a scoping task. The results of this effort should be in the work plan.

Response: See response to P. 2-2, par. 3, last sentence.

Comment: P. 2-21, Sec. 2.4.3.1, par. 2, line 1: Is "soil" truly soil as defined by a soil scientist? If not, it should be referred to as vadose zone or geologic material. We do not want to compare the background data from geologic material with that from true soil.

Response: The Background Characterization Report referenced here took background values from unsaturated Rocky Flats Alluvium, which is referred to as "soil" in the work plan. The text and Table 2.7 have been revised to reflect this.

Comment: P. 2-22, 3rd bullet, last line: Insert sediments and biota(?).

Response: This change has been made.

Comment: P. 2-22, 5th bullet: Add both the Woman and Walnut Creek drainages.

Response: These drainages are considered part of the "OU9 environs" described in the referenced passage.

Comment: P. 2-23, last sentence: What about the chemical waste analyses described on page 2-4?

Response: Efforts will be made to obtain these analyses during additional data compilation activities. Because the level of detail in these analyses is unknown, the sentence referenced in this comment has been removed. It is believed, however, that the waste transfer analyses were very focused and limited to primary contaminants of concern in the waste stream, primarily radionuclides (and sometimes only gross alpha and beta). They are therefore expected to provide only a general idea of the waste stream contaminants.

Comment: P. 2-24, Sec. 2.5.2, line 6: Insert sediments and biota(?).

Response: This change has been made.

Comment: P. 2-24, Sec. 2.5.2.1, bullets: Add bullets for corrosion and breakage (see page 2-19).

Response: This change has been made.

Comment: P. 2-25, line 1: Add "unless ponding occurred" after "trench materials." Also consider incompatibility between pipeline material and enclosed fluids. Incompatibility could have led to a release.

Response: The likelihood of ponding occurring in trench materials is considered very unlikely given the relatively permeable nature of the trench fill materials. However, the Phase I investigation is not limited to trench materials alone. The possibility of ponding, and resulting infiltration of native soil, will be addressed in technical memoranda for individual sites where Stage 2 soil sampling indicates the need for further investigation.

Incompatibility between pipeline material and process wastes are one mechanism through which corrosion can occur. Corrosion is addressed in the bullet list at the beginning of this section.

Comment: P. 2-25, last par., line 3: Discuss the origin and justification for this factor of 1.5 in the text.

Response: This number is simply a safety factor introduced to the conceptual model to accommodate uncertainties in the nature and behavior of OPWL pipeline releases. It does not have a mathematical or statistical basis because of these uncertainties.

Comment: P. 2-26, Sec. 2.5.2.2, bullets: Include a bullet for corrosion or breakage. Should also consider compatibility between tank material and contained fluids. Incompatibilities could have led to releases.

Response: The bullet list identifies areas of the tanks subject to corrosion (e.g., base of tank) and breakage (e.g., cold joints and structural seams). Incompatibility between pipeline material and process waste are one mechanism through which corrosion can occur.

Comment: P. 2-26, Sec. 2.5.3, 3rd sentence: Include potential receptors in the Woman and Walnut Creek drainages which may be impacted by groundwater and/or erosion of contaminated soil.

Response: Woman and Walnut Creeks are considered to be included in the OU9 environs referred to in this sentence.

Comment: P. 2-26, Sec. 2.5.4: This primary goal is not described as an objective in Section 1.1.

Response: The reference to Section 1.1 has been removed in response to this comment.

Comment: Table 2.5: State if the single hydraulic conductivity values are average values (e.g., mean, median, etc.) or approximate values.

Response: An attempt was made to obtain this information during revision of the draft final Work Plan, but an answer was not received in time to include in the final submittal. This comment will be addressed during revisions to the final Work Plan per EPA and CDH comments.

Comment: Table 2.6: State the source(s) of the OPWL waste stream characterization.

Response: This change has been made.

Comment: Table 2.6, 1st page: For Building 123, $HClO_4$ should be $HCrO^4$.

Response: The acid referred to is perchloric ($Hclo_4$).

Comment: Figure 2-4: Highlight the OPWL. It does not stand out adequately.

Response: This change has been made.

Comment: Figure 2-8: What about sediments and biota? Include in figure.

Should there be a line with an arrow that bypasses surface water above and left?

Response: Sediments and biota have been added to the figure. The placement of the suggested line and arrow was not clearly understood; however, a line does bypass surface water in connecting the release mechanism (leaks, spills and overflows) directly to receptors.

Comment: Figure 2-9: Include fugitive dust and sediment in surface water.

Highlight the bedrock/alluvial interface beneath the water table.

Response: These changes have been made.

Comment: P. 3-1, par. 1: Why is it not appropriate to discuss action-specific and location-specific ARARs in this work plan?

Response: EG&G currently is assessing ARARs, including action-specific and location-specific ARARs, on a site-wide basis. The results of this assessment will be applied to the OU9 investigation as appropriate.

Comment: ARARs Tables: Add the following ARARs:

1) DOE order 5400.5, Radiation Protection of the Public and the Environment

2) Endangered Species Act (ESA)

3) Migratory Bird Treaty Act (MBTA)

4) Fish and Wildlife Coordination Act (FCWA)

The latter three statutes have specific consultation requirements with the U.S. fish and Wildlife Service. Note that the ESA and FWCA are listed in Part II of the EPAs CERCLA Compliance with Other Laws Manual (EPA/540/G-89/009).

Response: The ARARs section included in the OU 9 Work Plan is a standardized discussion which has been developed with input from EPA and CDH and is included in each OU work Plan. Per discussions with EG&G, the ARARs section may be revised to incorporate the ARARs identified in this comment.

Comment: P. 5-1, par. 4: Reword last sentence.

Response: This change has been made.

Comment: P. 5-3, Subtask 1: Personnel interviews, an OPWL site walk and contacting personnel in facility operations should have been performed during scoping. I suspect much of the data compilation and evaluation could also have been performed during scoping.

Response: It originally was intended that the OPWL Closure Plan would provide all information necessary for planning the OPWL field investigation. It became apparent during preparation of the work plan that the Closure Plan information was insufficient for this purpose. Potential additional sources of information were identified, but the information could not be reviewed and incorporated into the work plan within the IAG milestone schedule for OU9. For this reason, the additional data compilation activities described in Section 7.2.4 will be conducted prior to the field investigation. The text has been revised to better explain the need for additional data compilation. Also, the data compilation is no longer described as an RFI/RI task, but is planned to precede the RFI/RI.

Comment: P. 5-4, par. 1: The detailed health and safety plan is a scoping activity and should accompany this work plan as required by the NCP.

Response: The NCP assumes that the work plan is prepared by the entity that will eventually implement the plan. In this case, a contractor was tasked with preparing the work plan but not with implementing it, and it was not appropriate to prepare a health and safety plan for the implementing contractor. The health and safety plan will be developed by the contractor that conducts the OU9 RFI/RI.

✓ Comment: P. 5-4, par. 4: If groundwater is encountered in a pipeline test pit, a groundwater grab sample should be collected. Add this to the text.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation. Section 7.3.1.1 has been revised to clarify sampling procedures when ground water is encountered in a pipeline test pit.

Comment: P. 5-5, Sec. 5.3.4: Add surficial soil sampling locations where liquids appeared at the ground surface, above-grade tanks and on-grade tanks.

Response: The FSP will target known locations of past OPWL pipeline and tank releases, including areas where releases are known to have impacted surface soils. Surface soil samples will be collected from each test pit and soil boring location, as illustrated in Figures 7-3 and 7-6.

Comment: P. 5-6, Sec. 5.3.4.2: For shallow tanks and pipelines, consider soil borings at a 45 degree angle to obtain samples below the structures.

Response: Angled borings were considered during preparation of the FSP, but input from drilling contractors and experienced field personnel indicated that the logistical problems associated with angle drilling were not worth the possible benefits. It is believed that significant leakage from underground tanks and pipelines will be detectable in soils (and particularly in bedding materials) collected from vertical boreholes drilled close to these structures.

Comment: P. 5-7, par. 1, line 2: Insert sediments.

Response: This change has been made.

Comment: P. 5-7: Add Section 5.3, Groundwater characterization. I recommend that a limited groundwater characterization be conducted in the Phase I RFI/RI. (This should include groundwater grab samples when possible during test pit excavation of pipelines and tanks.) In addition, groundwater samples should be collected at appropriate locations from soil borings using the BAT system as in OU 7. The parameter list should mirror the soils and vadose zone materials. Include these tasks in the work plan.

This initial groundwater characterization will be valuable in developing a Phase II RFI/RI Work Plan for a possible detailed groundwater investigation. The rationale for limited groundwater sampling during Phase I should be included in the text.

The FSP (Section 7) will need to incorporate this additional task also.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation. + COMPLIANCE FUNDING DOES NOT ALLOW OUT OF SCOPE SAMPLING.

Comment: P. 5-7, Task 6: A paragraph on dose calculations consistent with DOE Order 5400.5 and Chapter 10 of EPAs Risk Assessment Guide Document for Superfund should be included in the text for radionuclides.

Response: References to the DOE and EPA documents that shall be used for calculation of committed effective dose equivalent have been added to the text.

Comment: P. 5-8, par. 3, item no. 1: Replace with "Data Collection/Evaluation (identification of contaminants of concern)."

Response: This change has been made.

Comment: P. 5-8, par. 3, item no. 5: Delete since uncertainty analysis should be included in each of the above four categories. Uncertainty analysis should be discussed in the text.

Response: Uncertainty analysis has been deleted from Item No. 5 and the discussion has been moved to the general text.

Comment: P. 5-8, par. 4, line 1: Insert "and the NCP" after "As stated in the IAG."

Response: This change has been made.

Comment: P. 5-8, par. 4, item no. 1: Insert "future or potential" after "Current."

Delete items no. 2 and 3 since they are not part of the BRA.

Response: These changes have been made.

Comment: P. 5-8, par. 5: Task 7 should be initiated during scoping and should be done concurrently with all RFI/RI phases. This is true for alternative development and screening and is required by the NCP. The text should be revised to reflect this activity.

Response: The referenced text and the RFI/RI schedule in Figure 6-1 have been revised in response to this and other comments.

Comment: P. 5-8, Sec. 5.7.1, line 2: Add sediments and biota.

Response: Sediments were added as requested in this comment. Because the referenced text refers to remedial technologies, it was considered inappropriate to include biota in the discussion.

Comment: P. 5-10, par. 2, line 5: Add sediments and biota.

Response: Sediments were added as requested in this comment. Because the referenced text refers to remedial technologies, it was considered inappropriate to include biota in the discussion.

Comment: P. 5-10, par. 4, line 5: Add sediments.

Response: This change has been made.

Comment: P. 5-13, 2nd bullet: Add surficial soils.

For the 3rd bullet, add initial groundwater characterization.

Response: Surficial soils are part of the surficial geology (vadose zone soils) referenced in the 2nd bullet. Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: Table 5.1: Add capping.

Response: Capping was already included under the General Response Action of "Containment."

Comment: Figure 6-1: Include bar for the baseline risk assessment. This will need to extend to the left far enough to include environmental evaluation field activities, some of which were conducted during scoping.

Extend development/screening of remedial alternatives to the left consistent with project planning for compliance with the NCP.

Response: A bar for the baseline risk assessment has been added. Development and screening of alternatives has been extended to the left to be consistent with NCP project planning.

Comment: P. 7-1, Sec. 7.1, par. 2: The information in the third sentence should also be presented early in the text regarding not conducting investigations under buildings.

Response: This information has been added to Section 2.2.2 in response to this comment.

Comment: P. 7-1, Sec. 7.2.1, line 1: Replace "an iterative" with "a staged."

Response: This change has been made.

Comment: P. 7-2, par. 3, line 3: Replace "contamination plume" with "vertical and horizontal extent of soil contamination."

Response: This change has been made.

Comment: P. 7-2, Sec. 7.2.2: The laboratory program for OU 9 should consist of the following:

1) VOCs - screen with soil gas and portable GC. Use mobile laboratory for soil gas samples with hits, soil samples, wipe samples and groundwater samples. The mobile lab should use a GC-MS.

2) semi-VOCs - use mobile laboratory with GC-MS

3) metals - use off-site laboratory with two-week turnaround

4) radionuclides - use mobile laboratory

5) other inorganics - use mobile laboratory if possible.

Five to ten percent of the samples should be split with a contract laboratory.

DQO analysis levels for mobile laboratories should be at least level IV.

Contact John Dick, EG&G Rocky Flats, Inc. for assistance with designing a mobile laboratory program at 966-5960.

Response: Per discussions with EG&G, mobile laboratories are not currently planned for OU investigations. If mobile laboratories are in use at the time of the OU 9 RFI/RI, the FSP will be revised as appropriate.

Comment: P. 7-3 to 7-5: The following activities are scoping in nature and should have been completed prior to developing this work plan:

1) data compilation (Sec. 7.3.1)

2) site walk (Sec. 7.3.1.1)

3) interviews and record searches (Sec. 7.3.1.2)

4) historical release reports (Sec. 7.3.1.3).

Response: It originally was intended that the OPWL Closure Plan would provide all information necessary for planning the OPWL field investigation. It became apparent during preparation of the work plan that the Closure Plan information was insufficient for this purpose. Potential additional sources of information were identified, but the information could not be reviewed and incorporated into the work plan within the IAG milestone schedule for OU9. For this reason, the additional data compilation activities described in Section 7.2.4 will be conducted prior to the field investigation. The text has been revised to better explain the need for additional data compilation. Also, the data compilation is no longer described as an RFI/RI task, but is planned to precede the RFI/RI.

Comment: P. 7-6, bullets: Add a bullet for grab groundwater samples and BAT system samples.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: P. 7-6, par. 3: All radiological surveys should be conducted with a high-purity Germanium, gamma-ray detector. Ron Reiman, EG&G Rocky Flats, Inc., 966-5946, should be contacted for input to this work plan regarding surface radioactivity surveying.

Response: SOP FO.16, "Field Radiological Measurements," spells out the scope and requirements of prework radiological surveys at borehole locations, including necessary instrumentation. This SOP is incorporated by reference into the FSP as appropriate.

Comment: P. 7-7, par. 1: Grab samples and BAT system samples of groundwater should be collected for analysis. This should be referenced in the text of the work plan.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: P. 7-7, Sec. 7.3.2.2, line 1: Since preliminary assessment has a specific meaning under CERCLA, I recommend that this sentence be rephrased.

Response: This change has been made.

Comment: P. 7-7, last par.: Consider the use of angled borings for soil samples where appropriate.

Response: Angled borings were considered during preparation of the FSP, but input from drilling contractors and experienced field personnel indicated that the logistical problems associated with angle drilling were not worth the possible benefits.

Comment: P. 7-10, par. 2: The work instructions and inspection form for tank inspections should be presented in the work plan.

The site-specific Health and Safety Plan should include confined space entry procedures, etc.

Response: Data management for the OU9 RFI/RI will be performed by the contractor that implements the work plan. Forms or other methods of recording the data will be developed by the implementing contractor. The site-specific Health and Safety Plan will likewise be developed by the implementing contractor.

Comment: P. 7-11, par. 1: Add a bullet for a grab groundwater sample if available.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: P. 7-11, Sec. 7.3.3.2, line 1: See my comment for p. 7-7, Sec. 7.3.2.2, line 1.

Response: This change has been made.

Comment: P. 7-13, par. 1: Add grab and BAT system groundwater samples.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: Table 7.2: Add both grab and BAT system groundwater samples.

Response: Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: Figure 7-3: Change contaminant plume to contaminated soil in examples 1 and 2.

A BAT system groundwater sample should be depicted.

Response: "Contaminant plume" has been changed to "contaminated soil." Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: Figure 7-6: Change contaminant plume to contaminated soil in examples 1 and 2.

For example 1, a grab groundwater sample should be collected. In addition, a BAT system groundwater sample should be depicted.

Response: "Contaminant plume" has been changed to "contaminated soil." Per discussions between EG&G, CDH and EPA, ground water sampling is considered outside the scope of the Phase I investigation.

Comment: P. 8-1, 1st bullet: Change to Data Collection/Evaluation (identification of contaminants of concern).

Response: Text has been modified to Data Collection/Evaluation.

Comment: P. 8-1, last bullet: Delete. Uncertainty analysis should be included in each of the above four bullets.

Response: Text has been modified by deletion of uncertainty analysis bullet.

Comment: P. 8-1, par. 2: Begin a new paragraph with the sentence beginning with "Figure 8-1..."

Response: Text modified to reflect new paragraph.

Comment: P. 8-1, par. 2: Add a bullet for release mechanisms.

Response: A bullet for release mechanisms has not been added since the 2nd bullet covers release mechanisms.

Comment: P. 8-1: Include a paragraph on dose calculations consistent with DOE Order 5400.5 and Chapter 10 of RAGS.

Response: A paragraph on dose calculations consistent with DOE Order 5400.5, Chapter 10 of RAGS and Federal Guidance Report No. 10 and No. 11 has been added.

Comment: P. 8-2: Identification and description of contaminants of concern is the output of the Data Collection/Evaluation Process, not as shown in the text.

Response: Title of Section 8.2 has been changed to Data Collection/Evaluation.

Comment: P. 8-3: Insert Phase I before RFI/RI.

Response: Phase I has been inserted before RFI/RI.

Comment: P. 8-4, 2nd series of bullets: The upper tolerance interval description should include both a probability statement for alpha and the proportion of the population. Revise text accordingly.

Response: It is felt that changing this bullet will add to the understanding of the text and therefore it has not been modified.

Comment: P. 8-5: The bullets at the top of the page are redundant with the text on page 8-4 and should be deleted. This second procedure has not been agreed to by the RFP Risk Assessment Technical Working Group.

Add a section 8.2.4 on uncertainty in data collection/evaluation.

Response: The process of selecting COCs and TICs is presented in such a way that there is a lot of room for flexibility. This section should remain in the text as it is part of the overall risk assessment process and should be included in the RFI/RI Workplan as a defined task.

Section 8.2.4 has been added that describes uncertainty in data collection/data evaluation.

Comment: P. 8-5, line 1: Add "under both current and potential future conditions" to the 1st sentence.

Response: This change has been made.

Comment: P. 8-5, 2nd series of bullets: Add the following two bullets:

1) identify release mechanisms

2) estimate intake.

Response: This change has been made.

Comment: P. 8-7, line 1 and par. 2, line 1: Add "chemical-specific" before factors.

Response: This change has been made.

Comment: P. 8-7, Sec. 8.3.5: Add "and the results of contaminant fate and transport modeling" to the first sentence.

Response: This change has been made.

Comment: P. 8-8, par. 2, line 1: Delete the word "basic."

Add 'and/or numerical" after analytical.

Response: These changes have been made.

Comment: Change second sentence to read "Reasonable efforts will be made to minimize the variance of model output."

Delete the third sentence as it is probably not achievable.

Response: These changes have been made.

Comment: P. 8-10, part. 2, line 4: Change "nearly" to "nearby."

Response: This change has been made.

Comment: P. 8-10, last line: Should "Statistical sampling" read "statistical simulation?"

Response: This change has been made.

Comment: P. 8-11, par. 1: Delete the word "not" in line one.

Delete the words "magnitude and extent" in line two.

Response: These changes have been made.

Comment: P. 8-11 and 8-12: Include a section on uncertainty analysis for the toxicity assessment.

Response: This change has been made.

Comment: P. 8-13: This section should be included in Section 8.5 on risk characterization.

Response: This change has been made.

Comment: P. 8-13, 2nd to last line: Change necessary to possible.

Response: This change has been made.

Comment: P. 8-13, last line: Delete the phrase "if a vigorous analysis is required."

More detail is needed on quantitative uncertainty analysis planned for the BRA at OU 9.

Response: These changes have been made.

Comment: Figure 8-1: A bullet for evaluating uncertainty should be included in the boxes for data collection and evaluation, exposure assessment and toxicity assessment.

Include a bullet for fate/transport modeling in the exposure assessment box.

Response: The existing bullets in the exposure assessment box cover the topic of fate/transport modeling.